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MODERN EDUCATIONAL IDEALS[1]

The complaint is often made that modern education is too practical in its aims, and that as a consequence the coming generation will lose much of the beauty and richness of life which those of the present owe to their pursuit in past years of what are usually called cultural as opposed to vocational studies. I am to-day going to discuss the question whether this complaint is justified.

In attempting such a discussion it is necessary to distinguish between the aims of those seeking an education and the character of the education which is offered.

If we make this distinction, do we as a matter of fact find that the aims of those seeking a modern education are in any way more practical than were the aims of those who in the good old days sought to acquire the knowledge then available?

An examination of the history of universities and of such institutions of learning as antedated them would seem to show that almost everywhere and at almost every period the primary purpose of those seeking an education has been in very large measure a distinctly practical one. This purpose has been to acquire proficiency in the profession which they intended to follow. European education has always been devoted to the study of those things which were believed from age to age to be of definite use to the student at the close of his period of study. It has lost this vocational character at any particular time only in so far as there have been retained by tradition among the subjects in which systematic instruction has been given those subjects which have ceased to be of practical value, or as attention has not been devoted to new subjects which because of changed conditions have come to have practical value.

In the early history of education in Europe the only learned profession, that is an occupation for which a serious and systematic education was universally offered, was the clerical profession. In the church schools appearing in the days of Charlemagne, which were almost the only educational institutions existing in Europe prior to the establishment of the university, was given that instruction in somewhat theological and philosophical subjects which was supposed to fit men for clerical service. The higher clergy were for many years for all practical purposes the only educated class in the community. It was largely on that account that the position of the clergy, as a whole, was so important. Members of this class were, because of the intellectual and moral influence of the Christian church, the molders of such public opinion as then existed. They were, also, practically the only literary men of the day. From their ranks, finally, emerged many, if not most, of the politicians and statesmen who influenced and assisted kings and princes and guided the destinies of states.

The other occupations, some of which have since attained the dignity of learned professions, were in former days trades rather than professions. Entrance to them was the result of practical training rather

[1] Inaugural address read at the Johns Hopkins University on May 20, 1915.

than of systematic instruction. Indeed, in many lines of work the system of apprenticeship was the only form of education available. Sometimes those engaged in these occupations formed themselves into societies organized after the manner of the merchant and craft guilds which had so much influence on commerce and industry. As a result, both of association with their fellows and of instruction received from their superiors, the younger members of these societies acquired a knowledge, usually empirical in character, of the secrets of the craft or mystery to which they intended to devote their lives. Such, for example, in England, were the Inns of Court organized by the lawyers and the College of Physicians and Surgeons which looked after the interests of those engaged in the practise of medicine.

During the second half of what are called the Middle Ages universities were established. In them more or less systematic instruction was given in subjects which had not before the establishment of the universities been regarded as worthy of the attention of the learned, *i. e.*, the "educated" man. To theology and philosophy, which had constituted about all the learning of the day, was added very generally the study of law and medicine. The study of law first appears at Bologna, that of medicine at Salerno, in both cases before the establishment of the universities, but these subjects, from a very early time, found a place in the university. In England, however, law and medicine did not succeed in obtaining an important position in the educational system. The Inns of Court and the College of Physicians and Surgeons gave most of the legal and medical instruction which was given. The universities, nevertheless, exerted an influence on the development of both legal and medical study. For instruction in theology and philosophy, which might have a bearing on the solution of legal problems, was often given in the university to individuals who subsequently studied law as a trade in the Inns of Court; and although the study of medicine was in England carried on for the most part in the College of Physicians and Surgeons there was still in Oxford, at any rate from a very early time, a professorship of medicine. Students of medicine who were not satisfied with the facilities offered in England went, however—and in considerable numbers—to the continent for instruction.

The function of the early English university was therefore in large measure to prepare merely for the clerical profession, and it may be said that the English university has not even at the present time entirely emancipated itself from the clerical and monastic influences to which it was for so long a time subject.

The revival of learning had the effect of changing and broadening the work of universities. Systematic instruction was given in a greater number of subjects than before had been the case, particularly in the Greek and Latin classics. The aims of those who sought this instruction were, however, almost, if not every bit, as practical as in the past. Most men went to the university in order to fit themselves for their chosen career. There were, however, more learned professions than formerly. One could thus be a literary man without being a clergyman. The development of the secular statesman, which was largely incidental to the systematic study of law, also lessened the influence of the clergy in political affairs. But for a long time after the first appearance of the secular statesman it was almost necessary that a candidate for political honors should be well versed in what was considered to be the learning of the day. In England, for ex-

ample, until a comparatively late date a successful and persuasive speech in parliament must be replete with classical references and abound in quotations from Latin authors who were considered almost to monopolize polite literature.

The result was then both in England and on the continent that, even during the period when classical learning cast its most potent spell on the European mind, those who studied in the universities were actuated by the desire to fit themselves for some specified career. The candidates for the clerical profession, for the legal and medical professions, and for political honors, went to the university to pursue what were often regarded as and usually were vocational studies. They did not flock to the spring of knowledge to quench a thirst for learning. They drank of the waters rather to strengthen themselves for the race of life in which they had entered.

A distinct development of the study of theology and philosophy in the early days of European education was that phase of European intellectual life which is known as Scholasticism. Scholasticism is, of course, associated at the present time with almost anything but the practical and the useful. The determination of the number of angels that can dance on the point of a needle, or of the action of the historic ass placed between two bundles of hay, does not seem now to be of great practical value; but it may not be denied that the answer to these questions was considered in former days to be of fundamental importance. The later study of the Greco-Latin classics had somewhat the same influence on European intellectual development which the study of the Chinese classics has apparently had on Chinese life. It aroused a great admiration for the past and somewhat of a contempt for the present. At the same time a knowledge of the Greek and Latin classics had, at one time, great practical value. Even now it has such a value. Almost all modern European languages owe much to Greek and Latin, and books of even the present day are replete with classical allusions which can with difficulty be understood by those who have not had a classical training.

What was true of the medieval schools and of the early universities was nearly as true of the later university development. Most students who have entered the portals of the university have done so in order to carry on vocational studies, that is, in order to make themselves more effective in their subsequent careers. The sphere of activity of the universities has continued, however, to enlarge through bringing within the reach of their influence other occupations which had been regarded at one time in the nature of trades, but which began to take on the character of learned professions, and preparation for those professions has always been one of the most important functions of the university. The existing organization of the normal continental university shows clearly its practical or vocational character at the present time. That organization is based upon four rather separate and distinct faculties. These are the faculties of theology, philosophy, law and medicine. Of these all but the faculty of philosophy fit the student for a recognized learned profession. The only one that may not be said to be clearly practical in its aims is the faculty of philosophy. To this faculty are assigned all the subjects which do not find a place in one of the others. But because it is not the place of preparation for a recognized learned profession we must not suppose that the aims of the faculty of philosophy are altogether unpractical. For within its jurisdiction are philosophy, history, literature and the natural and po-

litical sciences, which usually occupy such an important place in the system of education adopted in the lower schools. It is to the faculty of philosophy that the training of teachers in those subjects is entrusted. Most of the students even of the faculty of philosophy are thus practical in their aims. For they are endeavoring to fit themselves for their life work of teaching.

One of the first, if not the first, of the new professions which was recognized by the early university was medicine. The advance of medicine to its new dignity was in large measure due to a change of European thought. It may be said that for a considerable period prior to the revival of learning European thought was in the main like the thought of most other parts of the world, theoretical and speculative. It laid great stress on supernatural causes for the ordinary phenomena of life and emphasized dialectic and *a priori* deductions from assumed premises. Intellectual curiosity with regard to life was satisfied by meditation and speculation rather than by investigation and experimentation. Men thought rather than observed; reasoned rather than generalized.

This attitude was not always, however, the attitude of the European mind. Early in the history of European thought there had been attempts made to observe, to gather data, to generalize inductively from these data and by the process of experimentation to limit the effects of the generalizations made. Aristotle and Archimedes, Hippocrates and Galen were among the men to whom observation seemed important, who sought by induction to reach conclusions and by experiment to test the tentative conclusions reached.

This early attempt to elaborate a scientific rather than a speculative method of treating the phenomena of life was, however, abandoned. The cause of its abandonment is not known. Changes in general social and economic conditions must probably be held in large measure responsible. But it is also just as true that Europe was being increasingly subjected to Asiatic political and intellectual influences. The conquests of Alexander the Great, although usually regarded as the triumph of Europe over Asia, also resulted in the subjection of Europe, or at any rate of that part of Europe which counted intellectually, to certain Asiatic influences. In the same way the expansion of Rome somewhat later had perhaps as much influence in bringing Asia to Europe as in causing the spread in Asia of European methods of thought. The *jus gentium* brought in by the Roman Prætor originated in large measure in Asia. The Asiatic principle of autocratic rule replaced the first feeble attempts at popular government made in Greece and Rome.

At about the same time that these legal and political principles originating in Asia became predominant in Europe, other important intellectual and moral ideas also of Asiatic origin made their influence felt there as well. These were the two great Asiatic religions, that of Mythra and Christianity. The religion of Mythra, while originally a rival, ultimately succumbed to Christianity and the only subsequent influence which it exerted was indirect.

The influence of the form of Christianity, which early developed and which alone we need consider, on the whole, did not encourage the development and application of the scientific method to the conduct of the ordinary affairs of life. The asceticism which had so much influence on early Christian thought inclined men to regard life in this world with indifference if not

with contempt. Different, however, from most religions originating in Asia, Christianity did not, certainly when applied by the European to whom it mainly appealed, lead to indifferentism. The Christian doctrines that this life was but a preparation for a vastly more important future life, and that the conduct of the individual in this life had a great influence on his future state, made of an earthly life a period of probation during which individual conduct counted for much. But as life in this world was regarded as of importance mainly because of its effect upon a future life, the study of its phenomena other than those affecting the ethical and spiritual relations of the individual was not carried on with any enthusiasm. Furthermore, the emphasis laid on supernatural tended to discourage the attempt to discover merely natural causes.

Whatever may have been the reason, it is certainly true that the early tendency towards experimentation and investigation, which would appear to have been the distinctive characteristic of the European mind, was checked, and Europe for more than a thousand years joined the ranks of those who thought and theorized rather than observed and experimented.

The revival of learning had for its effect, however, the readoption in Europe of its former intellectual attitude. Observation and experiment were perhaps first noticeable in the field of medicine. It may, perhaps, be said that the study of medicine had less than any other branch of human interest lost the characteristic European mental attitude. But medicine had suffered greatly not only from the intellectual attitude of medieval Europe but also from the lack of material with regard to which observations might be made. Galen, who dominated European medicine for so many centuries, had been allowed to dissect only animals and had as a result described incorrectly the structure of the human body. But in the latter part of the sixteenth century the study of medicine began to make great advances. Vesalius, from the dissection of human bodies, discovered and in 1542 published the truth with regard to the structure of the human body. In 1619 Harvey also by means of observation and experiment discovered the way in which the blood circulated, while Jenner, as a result of the application of the same methods, propounded later the theory of vaccination. The study of medicine became much more important and physicians were regarded more and more as belonging to a learned profession, proficiency in which was obtained by systematic study of newly organized subjects in institutions of learning.

The advances noted in medicine were accompanied by similar advances in what subsequently came to be known as the natural sciences. These advances at first were made in many, if not in most, instances by students of medicine. Thus Conrad Gesner, after taking his medical degree in 1540, became professor of natural science at Zurich and between 1551 and 1565 published his "History of Animals," and later wrote a book on mineralogy. He also took a great interest in plants and made important contributions to their study. Nearly thirty years after his death Cæsalpinus, also a physician, made along the lines pointed out by Gesner further contributions to botany. Paracelsus and Van Helmont, who did so much for chemistry in the early days of the science, were also physicians. Gilbert, an English physician, made about the middle of the sixteenth century in his book on "Magnetism" the first beginning of the study of electricity. Galileo himself was sent to the University at Pisa to study medicine and did actually

study it under Cæsalpinus, but preferred to devote himself to mathematics. He invented the telescope and was able thus to contribute to the science of astronomy which had been and was being greatly advanced by Copernicus, Tycho Brahe and Kepler.

While these important scientific discoveries were being made Bacon and Descartes were insisting that knowledge could be founded only on experience and that reliance could not safely be placed on authority or speculation.

The intellectual aristocrats of the day did not at first, however, regard scientific studies as exactly of the same rank as that assigned to the older better recognized studies such as theology, philosophy, law and medicine. In England these studies did not at first receive any recognition at the hands of the university, while on the continent they were generally admitted to the academic family circle under the disguise of philosophy.

As knowledge of natural science has increased, influences, in large measure attributable to the scientific method, have been at work which have given to our purely modern education its so-called practical character. In the first place, it has been found with our increasing knowledge of scientific truth that the application of the scientific principles which have been discovered to the conduct of the ordinary affairs of life is followed by great advantage. As a consequence a series of technical sciences have been elaborated. Thus, the application of the principles of geology has resulted in the development of a science of mining. The application of the principles of chemistry has been followed by the development of the science which is often spoken of as industrial or commercial chemistry. Out of physics have grown many of the engineering sciences.

Just as the development of an approximately scientific medicine resulted in transforming medicine from a trade into a learned profession, so the development of the engineering sciences has made the engineer out of the artisan, the architect out of the builder and the scientific chemist out of the ignorant and credulous alchemist. At the present time, furthermore, new sciences and new learned professions are in the making, as the principles of science are being applied in domains which have as yet not fallen completely under their influence. Scientific agriculture is fast replacing rule of thumb methods in the tilling of the soil. The scientific forester is taking charge of the conservation and exploitation of our forests. The mechanical engineer is devoting his attention to the problems of shop and factory. The naval architect is taking the place of the shipbuilder. Perhaps the furthest point to which the scientific method has been pushed is to be found in the United States where the new profession of efficiency engineer, as it is called, is claiming recognition. The efficiency engineer devotes himself to problems which not many years ago would have been regarded as unworthy the notice of an educated, much less a learned, man.

The distinctly practical scientific studies, that is the application of well-recognized principles of science to the conduct of human affairs, did not, apart from medicine, succeed in obtaining admission to European university circles at all. For their pursuit special institutions often called polytechnics or schools of some particular technology were established where students might be instructed in the learning not embraced within the university curriculum. In very recent years, however, there is a tendency in Germany towards the establishment by cities of universities

in which special attention shall be given to those branches of study that are regarded as indispensable to the efficient conduct of our modern life.

In the United States the university was not, however, so inhospitable as it was in England or even upon the continent. Its doors were not infrequently opened at an early date to the applied sciences and at the present time it is possible to find as integral parts of the university organization not only schools of engineering and architecture but as well schools or departments of agriculture, pharmacy, dentistry, business administration, veterinary medicine, journalism, education and household arts and domestic science. In these schools instruction is given in subjects all of which were formerly regarded as unworthy of the attention of the learned man, as connected with a trade rather than with a profession. Indeed it may perhaps be said that some university members still regard certain of these subjects with a considerable degree of academic suspicion.

The significance of this movement which has been so briefly outlined is that it consists in the application of scientific methods to the conduct of the ordinary affairs of life and tends to raise trades and occupations to the dignity of learned professions. Many instructors in our institutions of learning occupy a position in the life of the community quite different from that which not so many years ago was accorded generally to the members of the teaching profession. The fact that our modern education has to do in such large measure with the phenomena of ordinary life has given to many of those who are engaged in teaching the position of experts. Their services are being more and more demanded by those in authority as advisers and counselors and the old idea that a university professor was engaged in the consideration of things having no bearing on practical life is fast being abandoned.

This reestablishment of the original European conception of human life as worthy of study and the consequent adoption of the belief in the desirability of applying scientific methods to the conduct of its ordinary affairs have had far reaching results.

In the first place, investigation and research have been given a place in the educational system and are supplementing if not replacing introspective speculation and *a priori* methods. Those engaged in instruction and those being educated are expected by observation, experiment and inductive generalization to enlarge the field of human knowledge. This work has not, however, been confined to our universities. Much, perhaps more, work of investigation has been done in technical or professional schools not connected with universities, as well as completely outside of recognized educational circles, by men who either have had ample means or who have been subsidized by the government or by the bounty of private givers.

The success which in the domain of what are called the natural sciences has been attendant on the new methods, has not failed, further, to influence methods of study in the older branches of learning. Theology has been subjected to what is often spoken of as the higher criticism. Philosophy has tended to become more historical and inductive and less speculative and *a priori*. Psychology relies less on subjective introspection and more on objective experimentation. Law is coming more and more to be regarded as an evolution influenced if not controlled by the economic and social conditions which are to be regulated, and less and less as owing its origin and development to *a priori* deduction from fixed premises, themselves based on the hypothesis that there are universal, always

applicable, rules of human conduct. The study of literature now consists in large measure of the intensive examination of original texts. History, which formerly was perhaps based more on fiction than on fact, has been rewritten with the desire to attain in some degree the accuracy and precision characteristic of the pursuit of scientific truth. Economics and political science have become much less speculative and theoretical than they once were. While they have not as yet attained unto the dignity of exact sciences, probably because of the extreme complexity of economic and political problems, as yet only imperfectly understood, they are adopting more and more the methods of observation and inductive generalization and are fast losing the deductive character which at one time was incident to them and to which the general lack of confidence once expressed as to their conclusions may in large measure have been due.

This vast widening of the field of education and the notable change in the point of view to which attention has been called have had the effect of rendering somewhat less rather than more practical the purposes and aims of those who are attending our educational institutions. In former days, as has been pointed out, almost all students were pursuing vocational studies in order to fit themselves for a well-defined career. Now, however, in addition to students pursuing vocational studies we have two other classes of students. These are, first, a large number who are devoting themselves to the older learning, although its advocates claim for it under present conditions a disciplinary and cultural rather than a vocational value. Such students are not therefore professional students and are not pursuing vocational studies, and it is said that their aims are not practical in character. There is further a numerous class of students who are devoting a large part of their time to research and investigation. Some of them are in the philosophical rather than in a technical professional faculty. Others are, however, in such a technical faculty. For it must not be forgotten that in many such a faculty much work in the nature of research and investigation is carried on with great success. Nor should it be forgotten on the other hand that many students in so-called philosophical and non-vocational faculties have after all vocational and practical aims and purposes. They are studying in order to prepare themselves as teachers of the subjects which they have chosen.

The answer to the first question which has been asked must then be that education is at the present time rather less than more practical than it was formerly, if we are to judge it by the purposes of those who are being educated. A larger percentage of students are at the present time than formerly seeking an education which is not intended to fit them for a well-defined career or profession.

On the other hand it can not be doubted that the character of the education, opportunities for which are now open to the student, is more practical than it once was.

In the first place the subjects in which instruction is given are in many cases much more closely related to the facts of everyday life than were those to which the scholasticism of the Middle Ages devoted so much attention or than those embraced in the almost exclusively philosophical and literary education which was due to the influences of the Renaissance.

In the second place, there is a continuous tendency evident in almost all parts of the European world and particularly in those parts of it in which the attainment of economy and efficiency is receiving the most attention, towards granting some of the dignity of learned professions to what were

formerly regarded as mere occupations or trades.

Is this a tendency to be deprecated? It would seem that there can be no doubt as to the answer. Any one who has had the opportunity to observe the conditions of a country like China where the educational system has had little if any relation to the conduct of the ordinary affairs of life, where what is regarded as learning is the monopoly of a literary aristocracy which controls almost all the means of literary expression and insists upon the use by all who would write of an extremely artificial and conventional style, where there is no learned profession but that of literature, where, as a consequence, there is no career but a literary career open to an ambitious man and where no attempt is made to apply technical knowledge to any of the economic and physical problems of the community and the natural resources of the country remain almost completely without development—any one, I say, who has actually seen these conditions can hardly refrain from expressing the conviction that the so-called practical character of modern European and American education is one of the most significant and important manifestations of the European mind. He must believe that the dignity and beauty of life have not been sacrificed by giving to the physician an education which permits him to approach the sick bed with a confidence born of knowledge, which has made the precise and accurate engineer out of the blundering and ignorant artisan, the architect and naval constructor out of the carpenter and boat-builder.

Many of course will ask what will you do when you have built all your railways, canals and bridges, when you have wrested all her secrets from Nature, and your industry and agriculture have reached their maximum of efficiency? To what source will you then turn for consolation when your restless spirit of research has nothing further to investigate and the conquest of nature has become complete? We might respond after the manner of the courts when similar questions are propounded to them, that we will answer that question when conditions make it necessary. For no one will venture to say at the present time that there is not much work to be done in the nature both of investigation and of the application of well-recognized scientific principles.

But it is better to recognize what is undoubtedly the case that there are other things in education than the teaching of ways in which to conquer material nature. We of European origin have a long history and an extensive literature without some knowledge of which our present life is both inexplicable and shorn of much of its attraction. There are things of the spirit which bulk as large in our lives as the knowledge and conquest of material things. In our pursuit of knowledge and in our desire to improve our material conditions we should not permit ourselves to neglect our past nor overlook the artistic side of our nature. We must in our educational institutions, as has been well said, learn how to live as well as how to make a living.

At the same time the solution of the problem how to live and how to live rightly and efficiently is not inconsistent with the endeavors on the one hand to enlarge the field of human knowledge and thus to encroach upon the boundaries of the unknown, and on the other hand by the application of the scientific method to even what may be regarded by many as the trivial things of life, to envelop what may be looked upon as mere occupations with the dignity which results from accurate knowledge and the sense of doing things well.

May it not then truthfully be said that

educational ideals while perhaps more practical now than formerly are really to be distinguished from former ideals by reason of the fact that they are broader and more comprehensive. We no longer consider education as purely vocational or purely cultural. We no longer confine our study to theology and philosophy or to literature and mathematics.

The functions of modern education indeed are manifold.

In the first place it endeavors to transmit to the present generation a knowledge of our past. It makes us of the present day acquainted with what those of bygone days did and thought, hoped for and believed. It teaches us how we should live as the heirs of a European past with all that that involves.

In the second place educational institutions endeavor to broaden the field of knowledge along all conceivable lines. They encourage research and investigation with no ulterior practical purpose. Without such research the conquest of nature will be impossible. Unless we can discover new principles we may reach a time when further progress will cease.

Our educational system may of course provide for the study of applied science in institutions not connected with the universities which after the European example may be confined to instruction in the lore of the past and to research and investigation. There are, however, great advantages to be derived from the association of technical schools with universities, particularly where research and investigation with the idea of enlarging the sum of human knowledge are recognized as a part of the university's work. A technical school which is completely free from university influences is apt to devote itself exclusively to the imparting of already existing information, and is prone to make little if any provision for that research to which advance in knowledge is due.

Furthermore, at the present time it is commonly the case in this country that technical students take all their cultural studies before they take up their professional work. On the assumption that all the cultural studies necessary have been taken the student in the technical school is apt to receive a very narrow professional training. The association of such a school with the university tends to give a greater breadth to professional training by offering to the technical student the opportunity to do work along lines which are not strictly neutral.

In the fourth place, the presence in the university of persons who as compared with those in the outside world may be regarded as experts in their particular lines makes it one of the functions if not one of the obligations of our higher institutions of learning to proffer the services of their members to the communities in which they are situated. For whether these institutions are or are not what are technically known as state universities they in large measure owe their establishment and their possibilities for useful work to those communities. And apart from any such obligation it is the duty of educated men so to make use of their knowledge as to benefit the society of which they are members. The rendering of public service and preparation for rendering such service must be regarded as included among modern educational ideals.

The educational ideals of the present day are then very comprehensive in their scope. They include the disciplinary training of the young along general lines, the transmission of that particular knowledge of the past which will do most to develop persons of culture, the application of scientific methods to the conduct of the ordinary

affairs of life, the increase of our knowledge through research and investigation and the rendering of public service. None of those ideals is to be despised as unworthy of pursuit by men of learning. None perhaps may be selected as more worthy of pursuit than the rest. No institution which devotes itself sincerely and honestly to the pursuit of any of them may be regarded as unworthy the name of an institution of learning.

But the very comprehensiveness of these ideals makes it improbable that many institutions will be able to pursue them all with the same vigor. Almost limitless resources must be available in order that any one institution may be in such a position. Geographical situation may further make it desirable that certain of these ideals be emphasized at the expense of others. Universities situated at or near government centers may thus be able to render more effective public service than others less favorably situated. Urban universities may have better opportunities to do the work necessary to prepare for certain professions than those situated in the country. The ideals which each university should set before itself must thus be determined by its peculiar situation. But those which it adopts it should pursue with all its might. Its purpose should be excellence rather than comprehensiveness, quality rather than quantity. It should expand only so far as expansion will fit it better to discharge its main function and to pursue its principal ideals, or so far as the local needs incident to its geographical situation make such expansion necessary.

It is only when such an attitude has been assumed that it will be possible to eliminate an unhealthy and unwise competition between universities, all of which belong to the same brotherhood, all of which are pursuing the same general ends and all of which finally should cooperate in the great work of making the world in which we live a fitter, a better, a happier and a more inspiring place for human beings to inhabit.

FRANK JOHNSON GOODNOW

MEASURING THE ULTIMATE PRODUCT

AT the recent meeting of the National Education Association in Cincinnati the superintendent of schools of New York City in a masterly address referred to the common fallacy in educational thought of drawing analogies between physical and mental life. For example, some educators compare the child with a finished steel rail. In making the latter careful, definite and measurable processes are involved. The ultimate product is a steel rail, weighing eighty or eighty-five pounds to the yard, thirty or thirty-five feet long, well tested for the strain and stress of a certain type of trains—in a word ready to be spiked to the ties, a finished product. But can normal individuals be called finished products? At graduation from the various systems of education are they at all like the steel rail, finished, having reached a finality in their development—are they the ultimate product, and, if so, can this educational ultimate be measured?

The whole question raised by Dr. Maxwell involves the reasonableness of the modern scientific tendency in education. Is it as scientific as it claims to be; in fact can it be scientific? And is there possible such a phenomenon as an ultimate educational product?

Immediately one is confronted by another and a frequently discussed question: What is the ultimate product in education? At what are we aiming, we who are among the 700,000 teachers in this country? And toward what are the nearly 28,000,000 students in the United States

directing their efforts? In addition to definite vocational purposes in mind does education involve something that merits the name ultimate product?

The end in view has differed with the changing social emphases throughout history. Plato dreamed of education fitting the Athenian for the office of philosopher-statesman. Aristotle's system of education aimed toward a life that understood and desired pure goodness and absolute happiness. Quintilian, typical Roman and dominated by the ideals of the forum, planned his institutes as an educational guide for the producing of the Roman orator, by which he meant a man wholly fitted physically, mentally and morally to champion the just claims of the Roman citizen. These three educational theorists had in mind definite goals and so far as we can understand the methods involved were carefully considered and seem rationally sound in the main. Partly under their influence later theorists conceived of education as providing the ways and means whereby the individual might reach the maximum social and individual refinement. For example, Montaigne regarded the cultured French gentleman as the acme of education. Over against his exclusiveness Rousseau, with a sneer at artificial society, advocated with unrestrained passion an education by natural means through which the individual's impulses, instincts, natural tendencies might work their way to the top notch. The only habit the individual should form is that of forming no habits, writes Rousseau. Herbart, with his devotion to the commanding will, and Spencer with his scheme of harmonious development, and Locke with his profound faith in the ability of the human intellect to grasp all truth—each gave to the educative process a distinctive bent.

What now is the modern twentieth-century conception of the aim in education? Who is the Great Spirit that hovers over our curricula and school organizations? Plato, Aristotle, Quintilian, Montaigne, Rousseau, Herbart, Spencer, Locke, Froebel, Pestalozzi? Whose ghost leads the young student through the registration office and directs his hand while he subscribes to this or to that group? Or perhaps the ghosts are absent and in their place the young student is directed by educational striplings with the glow of new theories in their eye. It would seem that education is wholly diversified. In the language of William James all of us are in the clutches of the degree octopus, one tentacle B.A. and others B.S., B.L., M.A., M.D., C.E., Ph.D., etc. The complexity of modern society and the increasing scope of scientific studies make necessary distinct educational aims for lawyers, physicians, architects, engineers, teachers, et al., without attending to a common educational ultimate. At least this seems to be the thought of some critics. Is it true that the twentieth-century goal of education is *par excellence* vocational or, as Bagley terms it, bread and butter? Assuming that wealth is a means to enjoyment, leisure, and power, are we to believe that American education is sensuous in its main tendency? Are we Americans a people dominated by the ideas of the Epicureans and Cyrenaics?

I venture to suggest that back of these doubtless apparent ends we are reorganizing the entire school system from the kindergarten up through the graduate school with an all-controlling purpose in mind—a purpose not unlike that of the classic ancients but stated in terms that for us at least are more significant. Modern education, it has been remarked, rests upon several ideals, the literary, the physical, the moral, the religious, the vocational and the scientific. In each of these

there is a fundamental contribution to the great conception of education. This I believe may be termed *education for leadership. The ultimate product in education then is The Efficient Leader.*

In his inaugural address as rector of the University of Edinburgh Gladstone quoted the following words of Sir Robert Peel: "There is a presumption amounting almost to certainty that if any one of you will determine to be eminent in whatever profession you may choose and will act with unvarying steadiness in pursuance of that determination, you will, if health and strength be given you, infallibly succeed." Around our diversified aims there is this synthetic, this focal end that whatever our chosen and naturally endowed career may be it involves an opportunity *to lead.*

Now here is the question again: Can this ultimate product be measured? Can the process of producing leaders be measured? Dr. Maxwell, and many agree with him, thinks that neither the process nor the ultimate products can be measured, for the simple reason that in the realm of mental and spiritual life there can be no ultimate. Life is a growth and growth is a continual growing—a perpetual modification.

Many conditions in modern education have stimulated an increasing group of men and women to take a different attitude toward school work and to direct their efforts under the assumption that a large part of the learning process can be measured. They believe that the ultimate product should have certain qualities, a certain kind of skill that can be measured or standardized. They believe that the process of education ought not to be haphazard and theoretical, but readjusted by careful scientific experimentation and wide observation. They believe that the subjects taught in the various schools should be thoroughly scrutinized for non-essentials and for their scientific right to a place in the program of studies. They regard with suspicion the traditional claim that certain subjects provide mental discipline, and that there is indiscriminate transfer of training. They believe that in every subject deserving a place on the intellectual *menu* of the school there should be provision made for the producing of students mentally alert, keen to reason and ready to initiate. The scientific attitude in education is the same as that in every other science, namely, that of honest inquiry. The business world has adopted scientific management. There is a science of costs, a science of efficiency that every day saves millions of dollars and increases the amount and quality of industrial and governmental achievement. Educational investigators are trying to determine the minima in the several subjects, when these subjects should be introduced, what is the best method of teaching and of studying the subject-matter. The scientific educator goes to the laboratory, he goes to the schools, he investigates thousands of children or older students. Painstakingly he gathers his wealth of data, and after many months and after many others have performed similar investigations he ventures to formulate an educational law. The unscientific educator, however, believes that a subject should be taught because for centuries it has so been taught. Tradition and not induction has controlled the selection of school subjects and school methods.

But scientific education has a larger aim than the adequate training of teachers, important and fundamental as this is. Education as a college subject has a distinct service to render the laity, the larger number of students who do not plan to teach. I can illustrate this best by referring to some common experiences among younger and even older students. All of us at some

time have been thrilled by the alluring title of some course of study. "I want that," says the unsuspecting neophyte. He registers. For the first month everything is pleasant. The tasks seem easy. Then slowly the course becomes increasingly difficult and the student reaches a standstill, feels discouraged, drags his weary way to the office of the dean and begs to be excused from this course; with a pitiful plea he asks the professor in charge to allow him to drop this subject and with renewed enthusiasm he knocks at the door of another light and airy course. Setting aside those cases that have no capacity for the work undertaken, there are many others who become discouraged because their progress to them seems inadequate. Has scientific education any message of hope for such students? Investigators like Bryan and Harter, Swift and Book, have shown that in the process of learning there are inevitably several periods called plateaus during which the student apparently makes no progress. Things are on a dead level—a plateau. This has been shown to be true in experiments in learning to telegraph, to typewrite, in ball-tossing and in learning a foreign language. Bryan and Harter and Book say to students imprisoned on a plateau: Work harder. *It is intense effort that educates.* These halts and blockades call for greater ingenuity, more perseverance, more sand and grit. The learning curve is a long series of terraces—never a smooth incline.

Many have said the same thing in talks of an inspirational character, but scientific education goes back of inspiration and analyses the psychology of learning. Here is a typical individual engripped in an annoying habit. He feels that slowly it is gaining complete mastery over every department of his life. His character, efficiency and destiny are at stake. It seems impossible for him to break the habit. Investigators offer him a life-line. There are a dozen and more carefully worked out rules of habit-making and habit-breaking that offer ways and means of analyzing the difficulty and of dealing with each factor in a simple, direct manner. Self-control and self-mastery are found to result from a series of specific victories. Character and efficiency are measurable achievements resting upon many strategic battles hard won by a science of strategy and a science of personal control.

Modern penology as illustrated by Mr. Osborne at Sing Sing rests on scientific sympathy. Probably there is no such division of society as a criminal class. Lack of education, unwholesome environment, want of employment and ignorance of what comprises in the language of Thorndike The Original Nature of Man are contributing causes to practically all of the crimes on record. Modern psychology studies the instincts of beast and of man. Curiosity, imitation, play, fear, love, hate, sex, emulation, etc., are among the assertive instincts that shape a man's life. If these are studied and sympathized with they become a basis of fair judgment and act as searchlights across human conduct. Wrongs against society appear in a juster light. The penitentiary or prison is changed from a house of terror and revenge to a sanitarium and school where the individual is instructed and trained in the redirection of his instincts and not in the hopeless ordeal of destroying them, for they are indestructible and can be only redirected or substituted. Discipline in school and society is hereby made intelligent and effective. A knowledge of the meaning of instincts would revolutionize the discipline in many homes.

We are all students, some in person and others by proxy. We have our text-books,

briefs, essays, reports, problems, experiments. But what do we know about the actual methods of economical studying? The meaning of study is little understood. Under the vain hope of acquiring some esoteric knowledge many people subscribe for special courses in training the memory, not knowing that what is mysteriously imparted for large sums of money through these "memory schools" is common knowledge to students of scientific education. Since Ebbinghaus first gave the results of his work on memory hundreds of experiments have been performed in this field. To-day we possess fairly definite and effective laws of studying and of memorizing. They make the learning process less obscure and render a higher efficiency possible.

But studying is more than memorizing. On this phase of education I desire to place the acute accent. Our methods of studying stress memory rather than the ability to reason and to create. Almost any one can learn the various details of any course. Anybody can tie a wet towel around his head, place his feet in a bucket of hot water and imbibe frequently cups of black coffee while he crams and "digs" and "bones" through the long night for an examination. But the real student who wants to make a permanent possession of his course must be able to digest mentally by much chewing and normal eating the many relationships existing in the subject studied. To be a real growing leader one must know how to think. I believe that no one set of subjects more than any other provokes the student to think. Any subject worthy a place in the program of studies if properly taught and properly studied may stimulate the student in the art of thinking. Mere knowledge is an insufficient criterion of education. Scientific education is now stressing the psychology of learning. Mere memory work is being displaced by training in organization and in original thinking.

It is necessary only to mention the handwriting scales by Thorndike, Ayres and Starch, the composition scales by Hillegas and those offered in Newton, Mass. Here are very definite attempts to measure results. No one claims that any of these measures are perfect, but they blaze the trail to what is needed and doubtless possible.

These illustrations are only a few of many that indicate what is meant by scientific education and by the claim that the process of fashioning the ultimate product can be to a large extent standardized. Once men studied trees and plants haphazardly and superstitiously—to-day there is a science of botany. Once the higher forms of life were only casually observed and the lower orders wholly unknown—to-day zoology and biology are complex and generally accepted sciences. Once the earth itself was viewed as an endless flat expanse yielding harvests and materials for palaces and huts—to-day we recognize the sciences of geography, geology and forestry. Once man star-gazed not only with the lover's imagination, but with the evil machinations of sorcerers and astrologers—to-day the telescope sweeps the sky under the control of the scientific astronomer. Once the magician Cagliostro and his ilk ruled the minds of men with subtle mixtures, but to-day chemistry remakes the home and industry and in the science of medicine brings health and cheer to endangered lives. Once and in parts of the world still the farmer followed his crooked stick, making zigzagging furrows, wrenching from the accursed ground a stubborn harvest, but to-day the acres are alive with a willing yield produced under the direction of scientific agriculture which is fast removing the ancient curse from the fields.

Once men went to school to learn the three R's and religion under the instruction of a severe pedagogue who knew more about the quality of certain kinds of switches than he did about methods of teaching, but to-day there is dawning an era of learning that is well called the scientific period of school work, for along with the other once suspected but now accepted sciences education takes its stand in pleading for inquiry, experimentation, order and efficiency in all departments of school work. There is a science of education aborning.

Can the ultimate product be measured? Until recently personality was regarded as a mysterious *x*, a quantity destined to remain unknown. To-day the personality of teachers is analyzed into eighteen different elements, the Elliott scale being an example of this kind of analysis. The efficient teacher is now graded by well-accepted standards. The salesman's work is being standardized. The leader in all forms of activity can be measured by scales of efficiency equally precise.

In the several professional schools graduation from the department is supplemented by examinations under purely professional control, as in medicine, law and the ministry. The state has a right to examine those who in a peculiar manner aim to serve its citizens. The standards are becoming yearly more rigid, and rightly so. Educational institutions are being surveyed by such agencies as The Russell Sage and Carnegie Foundations. By careful investigations these examining bodies have concluded that certain conditions and a certain amount of efficiency must prevail in order to accredit schools in this or in that class. Many colleges are restive under this scrutiny. It means the closing of some, the thorough reorganization of others, and the modification and improvement of still others. School systems are being surveyed by impersonal expert agencies or by themselves. What is being done in the large should be done for every individual who is engaged in educational and professional work. And beyond this the standardization should go, so that leadership in every field of work may be known by certain accepted measures. The world to-day is looking to the educated classes for initiative and for economic and social poise. Sentimental education may have a place, but education by emotional methods no longer meets the needs, if it ever did. Leadership must come to mean something that is measurable. The psychologist is analyzing the religious emotion and finds that when rightly understood this basic instinct can be developed for good not dreamed of in the past. Education dealing with the whole man, providing the world with seers, scientific dreamers and leaders four-square must provide ways and means of analyzing the meaning and of measuring the results of its vast expenditures, its long periods of training and its constant readjustment to the demands of a new age. Slowly methods of investigation are being evolved. Gradually the confusion of records and diverse observations are being coordinated into definite laws and recommendations. A science is not born in a day. But the beginnings are here, and all interested in education should rally to the support of this noble project of finding additional ways and means of measuring the ultimate product of education. In the language of Dr. Eliot this product "is to be a man of quick perception, broad sympathies and wide affinities; responsive, but independent; self-reliant but deferential, loving truth and candor, but also moderation and proportion; courageous but gentle; not finished, but perfecting." But each step in this infinite evolvement must lead definitely toward the goal. We must chart the great

seas of character and of skill and then with compass boxed and power adequate sail forth to develop the regions science has discovered.

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CONTENT OF THE INTRODUCTORY COURSE IN ZOOLOGY IN A SMALL COLLEGE

ON TEACHING ZOOLOGY

OUT of 350 liberal arts students at Miami, approximately 50 in any year elect zoology. Of these fifty, ten may use their zoology in a business way either as teachers or as medical students. So one thirty-fifth of our student body gets a direct return from the department of zoology, and its courses, while four thirty-fifths take the work with the hope of benefiting along other lines than the professed scope of the department would seem to cover.

The distribution of students ought to determine the courses of instruction offered by the department and the aims of these courses. Evidently the training up of professional zoologists is not to be our object. Any students who are inclined to specialize in zoology must be treated as by-products, very desirable and to be trained with the utmost care, but still by-products.

There are certain definite propositions that can be made concerning this five thirty-fifths, or one seventh, of our college population which enrolls for zoology:

First, the aim should be to help the whole number of students to lead a more effective life rather than to help ten of them into a career in medicine or in teaching.

Second, as an aid to this effectiveness, they should be given the scientific method of approach to any subject. That is, they should be trained (1) to observe accurately, (2) to record precisely, and (3) to reason from the facts discovered. This reasoning is also known as forming judgment or judging. A good verbal memory may be a hindrance to reasoning, as dependence upon it may prevent one from thinking over the meanings of things and therefore hinder the habit of reasoning.

What is it to reason or to think? It may be divided into the following processes:

1. State the problem.
2. Gather all the available facts.
3. Form an hypothesis or a series of hypotheses to account for these facts.
4. Arrive at a tentative conclusion.
5. Test out or verify the conclusion arrived at, using all the facts in the case or enough of them to verify.

The result of the unconscious taking of these steps in regular order we call judgment, and as a person habitually does this well or poorly we say that he has good or poor judgment. When one draws conclusions and finds himself more and more often correct in his conclusions, he gets that confidence in his own powers which comes from success and makes for success. The habit of reasoning, of gathering the data, of marshalling these data and of coming to correct conclusions based on the data, very definitely benefits initiative, produces self-reliance, dispels timidity and therefore is favorable to creative work.

The danger of educating a large group of people at one time is that individuality is so likely to be suppressed. It is much easier to deal with a young person who accepts your authority without question than it is with one who must always know why. In my opinion one reason why nature study has not gotten a greater hold on the schools is because it so easily may be reduced to the accumulation of facts, merely increasing the child's stock of information instead of increasing its reasoning power.

In the grade work in the public schools the reading, the writing, the spelling and the number-work lay emphasis on memory and on skill. There should be as much training in lines that require observation and judgment. Such subjects are harder

to teach and are harder on the teacher and as a result are likely to be poorly done or omitted altogether.

Whenever students come up to the high schools with less ability to think than they might have developed, the path of least resistance will carry them into courses where memory may play an important part and the formation of judgments an insignificant part. So we have freshmen in college who do not think as they faithfully con over the statements of the book or the professor's form of putting things. And often the college graduate is not free from criticism on this point.

In spite of the fact that many persons, when asked Where, When, What, Why or How concerning any topic seem to consider any information whatever on the subject a satisfactory answer, the answers to these five questions are never interchangeable nor can they be substituted for. When this fault is found it is due to neglect by previous teachers. When a farmhand drives a team of horses carelessly it often happens that one of them refuses to pull until his team-mate has started the load or refuses to pull his share of the load. The horse is a much poorer worker from that time on. In the same way if a teacher is given a general statement in response to a precise question and lets it go without comment, the student will in time become in the habit of being un-precise in his answers and so will damage his powers of reasoning.

A man's intellectual ability depends chiefly on his ancestry, but his intellectual habits depend on his parents, his school teachers and the associates he has.

Taking up the subject of zoology specifically, there are, in my opinion, some of its subdivisions which are more favorable for developing the habits of making judgments, of raising problems to be solved and of acquiring preciseness in stating these problems than are other sections of the general subject.

The more favorable portions should be emphasized in the general, introductory course. This is the course taken by more students than any other, and it should be the course with which the department takes the most pains.

In my opinion morphology, the study of the form and structure of adult organisms, often known as anatomy, should bulk large in a beginning college course. Using the compound microscope one can obtain precise details of structure and even of cell structure. In studying a series of animals from the simplest to the most complex the student may acquire a large number of facts, so significantly related that he gets a sort of a forced understanding. He is almost compelled to draw the correct conclusions and form correct judgments as to the construction of the organs of the body. You may say that he is forced into comprehension by a cumulative series of facts arranged in logical order, the simpler first, the more complex last.

Moreover, it is clear that as these facts are accumulated with regard to structure, there opens up a stimulating field of mental exercise, that of interpreting structure in terms of function. These two lines of facts, structure and function, can often be used to check each other, and experiments may be devised that will prove structure in terms of function if the function is known, or function in terms of structure if the structure is known.

The course which I teach in Introductory Zoology begins with a study of the crayfish—as thorough as I can make it in order to teach the student to observe accurately, to record precisely the facts and to reason from the facts on an animal of a clear cut structure, much external differentiation

and a sufficiently large size so that the work can be checked. The student himself may easily appreciate his errors and learn the rudiments of how to dissect.

The use of the microscope as a measuring tool is also taught. Stage micrometer and eyepiece micrometer horizontally, the pitch of the screw of the fine adjustment vertically give scales for determining the three dimensions of any body seen under the microscope.

After this introduction we begin with the first of the animal series, taking several protozoans, a sponge, three forms of cœlenterates, the earthworm, the starfish, the mussel and the frog.

If a half year only were to be devoted to the work I should take the crayfish, cœlenterates and earthworm, hoping that enough students might be interested to elect some vertebrate work later.

I have sometimes been asked to justify the presence of the sponge and starfish on this list since they are in a sense widely divergent from the line of development of the animal kingdom. I use them because every repetition of structures which have the same or similar function is an aid in the comprehension of the function of the most complex of these structures. Moreover, when structures of a similar function are somewhat different the essentials of the structure are emphasized and the details fall into the background.

Just as in correcting a faulty outline of a drawing the student by partly closing his eyes can have the outline brought out more clearly, while the non-essential lines become indistinct or even fade away entirely. The reason for not using tapeworm, rotifer, bryozoan, etc., is because they are so far away from the general type of animal structure that they will only be new information and not directly aid in the reasoning processes.

The later courses in zoology may also be of general value. The study of a series of animals is termed comparative anatomy. From the standpoint of developing reasoning ability this type of study is valuable because it involves the *transfer* of judgments obtained in one field to other related fields, thus giving practise in correlating ideas. An unresourceful student is likely to learn a lesson with one set of conditions applying, and then be absolutely unable to put it into practise if the conditions be slightly changed.

Vertebrate comparative anatomy was the tool of Cuvier, Agassiz and Owen, with which, though not one of them believed in descent with modification, they carved out the larger relationship of the backboned animals and thereby prepared the way for Darwin.

Embryology, especially vertebrate embryology, is also very good for the exercise of the reasoning faculty. It is likely to demand more experience in interpreting facts than a freshman is likely to have had, and naturally is one of the courses which require introductory zoology as a prerequisite.

Paleontology is good thought-training material as far as it goes. The facts are fairly definite in this section of zoology when you have them, but they are likely to involve little but the skeleton, itself an easily modifiable structure, and they are certain to be incomplete.

Ecology, the inter-relationships of groups of animals, is in my opinion more difficult to utilize as training in a beginning course in zoology. The facts do not stand out with sufficient clearness for the average beginner to grasp them. The ecological factors, the water and heat relations, are to be seen much more clearly in plants than in animals and as a result plant ecology is much more nearly a science than is animal ecology.

Study of *function* (activities) is more difficult to be precise on than study of *structure;* as a result physiology and ecology should follow introductory morphology.

If the foregoing discussion is correct there is a definite reason why zoology is not taught in more high schools. If the part of zoology which is most effective to develop reasoning power is dependent to a greater or less extent on precise observations and since observations of this type may be made more easily with a hand-lens or in many cases with a compound microscope, the result will be and is that as far as each separate individual student fails to make accurate precise observations with these instruments of precision, so far will he fail in accumulating facts. These facts are the materials from which his hypotheses must be made, his judgments formed and tested out and he is handicapped in every process.

It is a pity that the line of arguments along which descent by modification was first demonstrated is so nearly isolated from the general public by its technical terminology. For to follow Darwin through his twenty years of experimenting to see whether his hypothesis of the origin of species by natural selection was borne out by the facts is almost the royal road to the understanding of evolutionary, not to say scientific method.

In the present day every science, one can almost say every line of learning, has been carefully worked out on the basis of the development of the more complex from the less complex, the complicated from the simple.

What if it should turn out that species depend for their origin very little upon natural selection? For my part I can not believe that Darwin's reasoning will turn out to be wrong, but grant that it is. Descent by modification is firmly held by every biologist, even though the method of this modification is not agreed upon.

Darwin's great lesson to the world was that of the method of work, the faithful and masterful accumulation of facts, the testing out of hypotheses without number and the rejection of those found wanting.

Economic phases of zoology

These are many and various, the most valuable and extensive being economic entomology, by which we hope to avoid the heavy tax laid on our crops each year (by the varied insect pests).

Fish culture is a line which can be developed as our countries become more crowded and the high cost of living even the simple life becomes more oppressive.

There is one small section of our history which illustrates the importance of zoological investigation and incidentally some of the by-products of war which are worth while. During the war with Spain in 1898 more soldiers died of typhoid by far than of the enemy's bullets. Our medical men had their attention directed to the disease, and as a direct result we have the "Swat the Fly" campaign and the protective injection against typhoid fever. The number of people saved yearly in the world if we ever get entirely rid of the typhoid bacillus will be beyond estimate.

Our occupation of Cuba set the medical men of our Marine Hospital service at work on yellow fever. Two doctors (Reed and Carroll) lost their lives in the experimental work, but the method of avoiding infection is now thoroughly understood even if the specific organism has not yet been detected. The miasma of swamps, the light of the moon and the night air have all proven an alibi, and the destruction of the mosquito has destroyed yellow fever. As an incidental result, the Panama Canal is nearing completion.

The surgeons with the army of occupation in Porto Rico found that the so-called laziness of the Porto Ricans was

caused by the hookworm, which readily yielded to treatment. They thought of the people of the United States of similar appearance. Some millions of able, effective workers are about to be produced for our country by the giving a few doses of thymol per patient and instructing as to the method of preventing other infection.

There are ideas which can be better illustrated during the study of one phylum rather than the study of other phyla.

The protozoa illustrate the structure of protoplasm, of course, and also generalization of structure. One would be equivalent to a fertilized egg among metazoa.

The sponge shows the internal spicular type of skeleton.

The cœlenterates have beginnings of specialization and from the taxonomic standpoint represent the gastrula stage of higher forms.

The lower worms, flat and round, show parasitism in its most specialized form.

The annelids are bilateral. They show beginning of typical excretory organs, accessory digestive cells and the ladder like ventral nerve cord.

The arthropods illustrate homology in the pairs of appendages and very great specialization.

The Chordate is most important of all because of its resemblance in structure to ourselves.

Zoology should continually emphasize function in view of the information with regard to one's own body which is necessary for successful living.

Zoology teaching should insist on a problem-raising and problem-solving attitude of mind. The raising of problems is as important as the solving of problems because unless one sees the problem it will never be solved.

Zoology should be so taught that the courses themselves will justify themselves by their value in training the reasoning power, and the importance of their content.

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COLLEGE PEDAGOGY

THE intellectual awakening which has penetrated upward from the elementary schools into secondary education bids fair to reach the colleges in due season. Already there are signs that the rapidly growing science of education has far more to offer the college than is being used within its walls. Constant teachers' meetings, associations, organizations, surveys, researches, tests, measurements of efficiency, objective scales for rating efficiency and school progress, curriculum and administrative reorganization, and a critical and scientific evaluation of courses and subject-matter are common among teachers, principals, superintendents and professors of education who deal with education below the college. The recent outpouring of books and magazines dealing with the educative process are practically all for the elementary and secondary phases.

The recent survey of the University of Wisconsin, the researches of a number of investigators and the studies of the research foundations are, however, leading the ferment higher. It is possible that the recently organized Association of College Teachers will bear somewhat the same relation to progress in college education that the National Education Association, the National Society for the Study of Education, and the National Society of College Teachers of Education have borne to the lower stages for a number of years. The college field seems a much better one for enterprise of this kind than even the lower fields. Without much unity of purpose, with little organized discussion of common problems, with almost no research along lines of edu-

cational values, methods and results, and, until quite recently, without the advantage of searching and continued criticism, the position of the college as a dominant institution dictating to the lower schools is in danger of being reversed; and the tail even now is beginning to wag the dog.

We have reason to hope that colleges will soon be ready to meet the lower stages half-way in their demand for thoroughgoing reorganization and unification of the entire educative process, especially for the *public* schools from kindergarten to university. College professors of education are becoming the intermediaries, adjusting the relationship of secondary to higher institutions. In our own State College, on the initiative of the President, an average of over a hundred of the faculty have been meeting once a week during the current school year to study and discuss problems of college teaching, management and educational values. In colleges, faculty meetings have always been relatively infrequent and largely administrative. These monthly meetings here have had added to them also a half hour of discussion of such problems as "the value and management of examinations." College pedagogy has been found to be as vast and as unexplored a field as was experimental psychology and methods of teaching and administration for elementary and secondary education a few years ago.

The writer expects to give later an account of our special experiment in college pedagogy during the past year in the hope that it may prompt more experimentation in this undeveloped field. The enormous waste, misdirected effort, and social inefficiency of our higher institutions warrant much effort along this line. College men are becoming aware of this fact and in most higher institutions will probably cooperate for any sound plan of improvement. Without doubt the time will soon come when college instructors will be given professional training for their work, the same as doctors and lawyers and teachers in the lower schools, not only before entering, but while in service.

We can learn something of what intelligent undergraduates think of college instruction from such papers as the recent one published in the *Educational Review* by an undergraduate.[1] Such criticism is worth studying. Recently the writer had some advanced students, who for the most part had had experience in teaching and who had all studied education, write on the good and bad qualities of their own instructors in high school and college. Several of these papers were read and discussed before the "Faculty Pedagogical Club," and the following digest of points, put in positive form, was made. We offer it here for what it is worth to junior instructors.[2]

QUALITIES OF A GOOD COLLEGE INSTRUCTOR. SUMMARY OF POINTS MADE BY TWENTY COLLEGE SENIORS AND JUNIORS WHO HAVE HAD ABOUT FORTY INSTRUCTORS EACH

1. A good instructor has scholarship in his subject. He does not find it necessary to stick closely to the text-book as a learning swimmer does to a life raft. The text-book is not usually open before him.

2. He does not conduct his work entirely by the lecture method, but has frequent give-and-take recitations. He stimulates discussion and is a good chairman of discussions.

3. In the freshman classes he starts with students from where they are, discovering their weaknesses due to poor preparation, as in English and mathematics, and helping them to overcome them.

4. His lectures and his recitations are well organized. They are connected up with previous lessons; the main points are stressed in many

[1] January, 1915.

[2] A special offshoot class of the F. P. C. meeting after the larger group of over a hundred each week, is using Yocum's "Culture, Discipline, and Democracy" and Parker's "Methods of Teaching in High Schools," as a basis of discussion.

ways; irrelevant matter is kept out. The student is made to understand the purpose of each lesson, and feels, as the lesson progresses, that he is going forward step by step to accomplish the purpose of the lesson. Outlines of the term's work and of the day's work are used to help bring out main points and to organize them in the pupil's thinking.

5. He is not too abstract and theoretical, but has a carefully collected set of illustrative applications to the probable use of knowledge gained and its bearing on present-day issues. He uses many means of illustration, such as the blackboard, pictures, objective materials of various kinds, and the like. He understands present-day conditions well enough to connect his work up effectually with "the world to-day."

6. He avoids overemphasis of pure memory work and gives a great deal of training in thinking. He understands also the importance of drill and review, and the *use* of knowledge gained in order to make it stick.

7. Technical terms are made clear by writing them on the blackboard rather than by spelling them orally.

8. He knows how to use his voice. He does not hesitate and halt, speak too fast, permit his voice to rasp and whine, nor does he thunder at the students in a violent manner.

9. He does not overemphasize note-taking but requires careful systematic notebook work where it is necessary, and is interested more in students understanding what he has to say and thinking on it than in writing many pages an hour at his dictation.

10. He has a sense of humor and a spirit of genuine good nature—a spirit of joyful strenuous endeavor. His jokes, if any are used, are not stereotyped chestnuts used for each succeeding class, but they grow naturally out of his spirit of good will in class work.

11. He keeps students constantly on the alert, expecting at any moment to be called on or to be held responsible for an understanding of the subject-matter that is being taught. There is no asking of questions alphabetically or according to number in his class room. He has a large majority of the students vigorously engaged most of the time.

12. He so emphasizes energetic work in the classroom and is so skilled in class management that he has no trouble with "discipline." Students do not recite from an open book in his class nor do they surreptitiously read newspapers and other books.

13. Practicums and laboratory work are so conducted as to economize time and effort and to emphasize essentials rather than non-essentials. (Students think there is a good deal of waste of energy and time in these courses when not well conducted.)

14. He encourages initiative and individuality on the part of students. He distinguishes between the student who wants merely to get into his good graces and the one who wishes to know more and is intellectually interested in the subject. He devises ways and means by which individual students may make contributions to the class, such as special reports, the preparation of illustrative matter, etc.

15. He has a vital interest in his work and seems to regard it as a dignified and desirable profession, one in which he is giving and getting as much as possible. His enthusiasm is catching.

16. He is manly, straightforward and sociable. By individual conferences before and after class and in private, he gives many effectual educative touches of the greatest value to students. He does not bear merely an official relationship to students, but has "the human touch."

17. He gives evidence of making careful daily plans for his lessons. His students do not drink from a stagnant pool, but from a clear running stream. Preparation is noticed in the command of subject-matter, in the quality of questions asked in the class, in the organization of the lessons, in the connections made with current affairs and in the type of illustrations used.

18. He is not always a person with the highest academic degrees. Some of the best teachers are now instructors and "men of low degree," according to students. He realizes that no one has taught until some one has learned; that the test of his teaching is not the ability to expose his intellectual wares, but to make sales—to be a good salesman—to make educative changes in his students. He does not carry with him the spirit of "take it or leave it."

19. He realizes that most students probably have too many subjects and study each term more subject-matter than their minds can well assimilate. Consequently, he is very careful about his assignments of text-book work, of papers to write, and of references to read. He diligently studies educational values and attempts to select that knowledge, those habits, and those ideals which are of most worth to his students, and then emphasizes these minimum essentials. (One of the most important pieces of work that is now being done in elementary and secondary education is

that of selecting the fundamental minimum essentials for the various courses of study.)

20. He shows pupils at the beginning of a term the importance of the work which they are to do during the term. He makes them feel that in his course they have a great opportunity to do something and contribute something which is fundamentally worth while. They start the term's work right.[3]

21. He realizes the importance of carefully planned assignments, made at some length in many cases and usually stating exactly what is to be done, what are the difficult parts, and what should be especially emphasized. Sometimes a special assignment is given to a pupil or a group of pupils. He makes this assignment before the last bell is rung and takes time for it, either dictating it or writing it on the blackboard. He uses the opportunity for teaching students how to study.

22. He avoids marking students in class on their recitations,—at least in such a manner as is noticeable to them. He, however, measures as well as he can the quality of each student's class recitation and other contributions. He is favorable to the present movement toward measurement and a *science* of education.

23. He uses his examination periods for reviewing, organizing and helping the students to use and apply subject-matter, skill, and ideals gained in his course. Such examinations are not a waste of time. He gives frequent five-minute written or oral quizzes in certain lecture courses. In most subjects, however, he uses questions so frequently that he does not need frequent oral quizzes, although these are sometimes used. Generally he hands examination papers back early and goes over the questions with the students in class and frequently with individual students in private. He teaches the students how to write their answers distinctly and to the point.[4]

24. He teaches the pupils how to study, how to plan a program of extra class work, and how to economize effort in this direction. The learning process is as important to him as is the teaching process, and each assignment contributes something to efficient study.

25. He realizes the importance of class-room hygiene, especially such matters as temperature, ventilation, lighting, and exercise. In many cases a good instructor furnishes opportunity for physical movement such as is obtained by sending pupils to the board and having them do special pieces of work or demonstration for the class. He opens the windows and flushes out the room between recitations and sees to it that the shades are up or are so regulated as to give the best kind of light. His energy and enthusiasm make for good mental hygiene and no pupil sits mentally torpid throughout his class periods. He keeps his students active, awake and alert.

26. He is generally independent of lecture and recitation notes and practically never reads them off word for word for any length of time.

27. While lecturing he throws out frequent questions, asks for illustrations of points made, and requests criticisms.

28. If he has a class larger than twelve or thirteen in number, he usually stands throughout the recitation instead of sitting at his desk. With smaller groups he makes a recitation more of a round-table. He does not miss calling on individual students for long periods of time, but sees to it that every student is called upon frequently for class recitation. His assignments are made either as problems or questions, as topics to be looked up and recited on at some length in class, or as special projects, problems and pieces of work to do.

29. He trains students to judge the relative values of different phases of subject-matter and trains them also to criticize tactfully the recitations of the students of the class as to their pointedness and fitness.

30. He is clean and neat in his person, though not a dandy. He is shaved, his collar is clean, his clothes are well pressed, and his shoes are polished.

31. He uses good English and does not descend to slang and vulgar expressions.

32. He has a wholesome lack of faith in formal discipline, in the general training of reasoning, memory, etc., by formal subjects.

33. He frequently inculcates ideals and aspirations for superior work in his subject, and for thoroughgoing preparation for efficiency in the world.

Louis W. Rapeer

Pennsylvania State College,
State College, Pa.

[3] See a student's criticism in the *Educational Review* for January, 1915.

[4] The University of Chicago has investigated certain of these problems of instruction by getting the views of alumni and undergraduates. See Parker's book mentioned above, chapter on "Measuring the Results of Teaching."

EDUCATIONAL EVENTS

HEALTH SUPERVISION OF CHILDREN BEFORE SCHOOL AGE

THAT special medical attention should be given to children in the four or five early years before school begins is argued by Dr. David Forsyth, an English physician, whose views are published in a bulletin just issued by the United States Bureau of Education. Dr. Forsyth declares that medical inspection of elementary school children points to a widespread physical deterioration during the first four or five years of life, which leaves the majority of children with serious but preventable defects.

Dr. Forsyth says:

> Little or nothing has been done as yet by way of solution. Preventive measures limited to the first years are unlikely to have much influence in warding off later troubles. A gap, at present unabridged, stretches from the first year to the fifth, when the school medical inspection begins.

As a suggested remedy Dr. Forsyth describes a plan adopted in the city of Westminster, England. In January, 1912, a medical inspection center was opened for children of school age in the north half of the city. Here a staff of health visitors is maintained, to get into touch at once with every family where a child is newly born. Through this staff every child in the district is kept under medical supervision from the time of its birth until the end of its fifth year, the purpose being to hand the child over sound and healthy to the school authorities.

Of 374 children examined during the first year of the center, 131 were under 1 year of age, 77 under 2 years, 83, 50 and 33 under 3, 4 and 5 years, respectively. The medical record cards showed a rapid rise in the tide of disease with each year of life. It was found that while most children in the first period are healthy, only a small minority come through to the fifth year without at least one physical defect of some kind.

Dr. Forsyth concludes:

> Large numbers of children, healthy in all respects at birth, become within five years the physically defective entrants whom the education authority is required, at no small cost, to restore, so far as possible, to their original state of health. Yet most of these cases are preventable, or, if taken in time, can be remedied more speedily, and therefore more cheaply, than if left until school age, by which time not a few will have received permanent damage—physical or mental. The problem of the defective child largely resolves itself into the problem of the under-school age child, and seems hardly likely to be solved by anything short of a general plan insuring to all children regular medical supervision from birth to school age. And this, to be fully successful, must run side by side with educational measures for instructing the mothers themselves who, from ignorance far more than from willful neglect or even from indigence, are unable to safeguard their children's health.

CONFERENCE ON RELIGION

MANY of the leading theologians of the country have been secured to lecture at the Conference on Religion which has been planned as a part of the summer session this year at Columbia University. This conference is a novel innovation at the university and it is expected will attract wide attention in religious and missionary circles.

The conference opens on July 6 and continues to July 16. During this time the course at the summer session will be thrown open so far as practical to the visiting clergymen and religious workers. In addition to the conference, many courses on religion have been added to the summer session schedule and these will continue throughout the entire six weeks of the session. Professor Hugh Black, D.D., Union Theological Seminary; Rt. Rev. Arthur Selden Lloyd, D.D., president of the board of missions of the Protestant Episcopal Church; Professor Arthur C. McGiffert, Ph.D., Union Theological Seminary; Professor Robert W. Rogers, Ph.D., Litt.D., Drew Theological Seminary; Professor William Adams Brown, Ph.D., Union Theological Seminary; Professor James Hardy Ropes, D.D., Harvard Divinity School; Rev. F. M. Crouch, executive secretary of the joint commission on social service of the Protestant Episcopal Church, and Mr. W. H. Jordan, director of the New York Agricultural Experiment Station, will all lecture and conduct discussions.

Numerous excursions, concerts and organ

recitals are provided by the summer session, and such as come within the period of the conference will be open to the delegates. The dormitories at the university for both the men and women will be open to the visiting members of the conference.

ACADEMIC CELEBRATIONS

The program for the celebration of the fiftieth anniversary of the Worcester Polytechnic Institute is as follows:

Sunday, June 6

4.00 P.M. Baccalaureate sermon in Central Church.

Monday, June 7

8.00 P.M. Annual commencement address before Sigma Xi.

Tuesday, June 8

2.00 P.M. Dedication exercises at Alumni Field; laying the corner stone of the new gymnasium.

3.00 P.M. Base ball game.

8.00 to 10.00 P.M. Reception by President and Mrs. Hollis to delegates, invited guests, trustees, faculty and alumni, at the Bancroft Hotel.

Wednesday, June 9

10.00 A.M. The academic procession of speakers, invited guests and delegates forms at the Bancroft Hotel and marches to Mechanics Hall.

10.30 A.M. Celebration exercises in Mechanics Hall. Addresses by engineers and others of international reputation.

1.00 P.M. Lunch at the institute.

2.00 P.M. Automobiles will leave for the special meeting of the American Society of Mechanical Engineers, to be held at the works of the Norton Company, Barber's Crossing, at which papers will be read and discussed.

7.00 P.M. Banquet at Bancroft Hotel. Speeches by men of international reputation.

Thursday, June 10

10.30 A.M. Commencement exercises in Tuckerman Hall, address by an eminent engineer.

2.00 P.M. Alumni dinner in the electrical engineering laboratory. Exercises at which honors will be conferred and bronze tablets unveiled.

The program for the inauguration of Dr. H. C. Bumpus as president of Tufts College on Saturday, June 12, has now been completed. It is as follows:

10.30 A.M. Inaugural exercises.

Addresses by A. Lawrence Lowell, president of Harvard University; Charles E. Fay, senior professor of the faculty of arts and sciences; Charles F. Painter, dean of the Medical and Dental Schools; Samuel P. Capen, president of the Alumni Association; Hermon C. Bumpus.

12.30 to 2.00 P.M. Luncheon in Goddard Gymnasium.

2.00 P.M. Public discussion: "The Obligations of the College to the State." Participants: David I. Walsh, governor of the commonwealth; Louis E. Reber, dean of university extension, University of Wisconsin; Kenyon L. Butterfield, president of the Massachusetts Agricultural College; Sarah L. Arnold, member of the State Board of Education and dean of Simmons College; William C. Hill, principal of the Central High School, Springfield; Alexander Meiklejohn, president of Amherst College. The discussion will be closed by G. Stanley Hall, president of Clark University.

5.00 to 6.00 P.M. Reception at the president's house.

HONORARY DEGREES AT JOHNS HOPKINS UNIVERSITY

After Dr. Frank J. Goodnow had been installed as president of the Johns Hopkins University and had given the inaugural address which is printed in this issue of School and Society, the degree of doctor of laws was conferred by him on a number of distinguished scholars and men of science. In presenting them Dr. William H. Welch spoke as follows:

Henry Carter Adams, professor of political economy in the University of Michigan, a teacher, writer and investigator of distinction in the field of economics, whose contributions have laid the foundations of the science of public finance. Instrumental as statistician of the Interstate Commerce Commission in fixing the forms of railway accounting in the United States, he has likewise placed his great knowledge at the service of the recently established Chinese republic in the endeavor to bring order into the finances of its railways; thus exemplifying the best ideals of American scholarship and of public service, his name worthily heads the roll of doctors of philosophy of this university.

John Mason Clarke, state geologist and paleontologist of New York, professor of geology and mineralogy in the Rensselaer Polytechnic Institute,

eminent contributor to the science and literature of geology, especially by his comprehensive studies and discoveries in the evolution, migration and structure of the relics of ancient life in the oldest divisions of the rocky framework of the earth. Keen decipherer of the obscure and shattered records of geological history.

JOHN DEWEY, doctor of philosophy of this university, through whom the Johns Hopkins has contributed to the greatness of that sister university (Columbia), from which, sir, we have of late sought due return; eminent among contemporary philosophers and one of the foremost among those who in our time and country have influenced the ideals and the practises of the teachers of children in this and other lands; an accurate and subtle reasoner who yet holds that all reasoning is instrumental to the ends of practical adjustment, and that both the process of learning and the nature of knowing can be rightly understood only in their relations to the entire active and social life of man; a truly American because a thoroughly democratic and pragmatic philosopher.

SIMON FLEXNER, formerly student, assistant and professor in this university, director since their foundation of the laboratories of the Rockefeller Institute for Medical Research, an investigator who has brought renown to American medicine by his contributions to pathology and bacteriology, foremost in the development of the most fruitful institution for medical research in America, endowed with the precious gift of inspiring others, fortunate and happy in the ability to apply new knowledge to the control of disease and the saving of thousands of human lives.

GEORGE WASHINGTON GOETHALS, major-general of the United States Army, chief engineer of the Panama Canal, first Civil Governor of the Canal Zone, whose genius is in administration, in winning the devotion and loyalty of helpers and workers and in the application of engineering knowledge and skill has brought to successful completion a stupendous work of great difficulty, thereby rendering signal service to his country and to the commerce of the world. While severing a continental band he has at the same time knit together with closer ties of intercourse and of interest the nations of the western world, a name writ large in the history of his country.

GEORGE LYMAN KITTREDGE, professor of English in Harvard University, an eminent scholar in English literature and language, an inspiring teacher, a productive and indefatigable investigator, especially in the middle English period, our foremost Chaucerian authority, who has likewise followed the traditions of his illustrious predecessor, Professor Child, in carrying forward the knowledge and the interpretation of the English and Scottish ballads—a student fruitful in contributions to knowledge, combining erudition with literary charm and searching criticism with sympathetic appreciation.

ABBOTT LAWRENCE LOWELL, the president of Harvard University, an enthusiastic and stimulating teacher and student of the science of government, contributing largely and with penetrating analysis to our knowledge of the organization and operation of European governments. As head of our leading university while worthily maintaining its great traditions, contributing wisely, vigorously and broadly to the solution of many pressing problems of higher education, keenly appreciative of the needs both of college students and of professional training.

THOMAS HUNT MORGAN, professor of experimental zoology in Columbia University, the best type of the devoted student of nature, not to be turned aside from the undeviating pursuit of science, investigator of those branches of biology which are of deepest human interest, whose researches at this moment still in the full tide of progress, the most fundamentally important in this field since those of Mendel, have laid bare the intricate constitution of the material of heredity and have given a hitherto undreamed of insight into the laws and mechanism of inheritance.

MICHAEL IDVORSKY PUPIN, professor of electromechanics in Columbia University, welcomed to-day to this state, where he, an ardent Serbian youth, found his first American home, with all the coming years before him of successful struggle and brilliant work and achievement in the domain of mathematical physics, known best to the world as one who has made long-distance telephony possible, known to physicists for the originality and profundity of his investigations into the fundamental relations of electricity and matter, known to engineers by the unusual combination of knowledge of engineering difficulties, of physical insight and of mathematical skill. By his discoveries and inventions a benefactor of mankind, a leader in American science, a distinguished representative of his race.

PAUL SHOREY, professor of Greek in the University of Chicago, the widely and deeply read scholar, the brilliant writer, the searching critic whom I can not better characterize than in the words, the source of which he and others will recog-

nize and appreciate: "Hellenist and humanist, sympathetic interpreter of Plato's spheral thought, and of the intimate charm of Horace, champion of American scholarship."

Henry White, for many years in our diplomatic service in London and our Ambassador to Italy and to France, the representative of our country in important international conferences, distinguished as one of the few trained diplomats of the United States. He has rendered valuable service in the promotion of international good will, a service especially fitting in these days of bitter strife between nations, when the best qualities of character, of training, of knowledge, of good will and high diplomacy are needed as never before for the restoration of the world's peace and welfare.

Robert Simpson Woodward, president of the Carnegie Institution at Washington, formerly professor of mechanics and mathematical physics in Columbia University, a valuable contributor to the sciences of astronomy, of geodesy and of physics, especially by its application of mathematical theory, with results susceptible of experimental verification. Long active in the advancement and organization of scientific studies for the last decade, he has rendered a large constructive service to American science as the executive head of a great foundation whereby the opportunities and the attractions of research have greatly enlarged and improved and the boundaries of useful knowledge widely extended. A broad-minded man of science, a wise, vigorous and far-sighted administrator.

EDUCATIONAL NOTES AND NEWS

Dr. Henry Suzallo, professor of the philosophy of education in Teachers College, Columbia University, has been unanimously elected president of the University of Washington. He was born in San José, Cal., in 1875, and was graduated from Leland Stanford University in 1899, receiving the Ph.D. degree from Columbia University in 1905. From 1903 to 1905 Professor Suzallo was fellow and lecturer in education at Teachers College; from 1907 to 1909, adjunct professor of elementary education, and since 1909 has held his present chair.

Dr. J. C. Branner has consented to retain the presidency of Leland Stanford University during the coming academic year.

Dr. Basil L. Gildersleeve, professor of Greek at the Johns Hopkins University since its foundation, will retire from active service at the close of the academic year.

Professor J. M. Powis Smith, of the department of Semitic languages and literatures in the University of Chicago, has been appointed editor of the *American Journal of Semitic Languages and Literatures*, to fill the place so long occupied by Professor Robert Francis Harper, of the same department.

Commencement at the University of Illinois will be held on June 16, when Dr. Romulo S. Naon, the minister from the Argentine Republic, will deliver the address.

The Butler gold medal to be awarded every fifth year by Columbia University for the most distinguished contribution made during the preceding five-year period to philosophy or to educational theory, practise or administration will be given to the Hon. Bertrand Russell, F.R.S., lecturer and fellow of Trinity College, Cambridge, for his contributions to logical theory. The Butler silver medal is to be awarded to Professor Ellwood Patterson Cubberley, of Leland Stanford Jr. University (A.M., Columbia, 1902; Ph.D., 1906), for his contributions to educational administration.

Professor Robert A. Millikan, of the University of Chicago, delivered recently the "Thomas Lectures" at Richmond College. The general topic was "The New Physics."

Dr. Thomas Ordway, of the Harvard Medical School, has accepted the deanship of the Albany Medical College. Dr. Ordway was formerly professor of pathology in the medical school of which he now becomes dean.

Dr. Bird T. Baldwin, professor of psychology and education at Swarthmore College, will have charge of the undergraduate and graduate courses in educational psychology at Johns Hopkins University this summer.

Dr. Charles W. Crampton, of the New York Normal School of Physical Education, will give courses in physical education, in the summer school of Dartmouth College.

PRINCIPAL CHARLES E. CLEVELAND, of the Portland School of Trades, Portland, Ore., which city is about to erect a new building for its trade school, is visiting eastern cities to obtain ideas regarding the construction of buildings and methods of training.

MR. ERNEST C. WEBSTER, of the Kamehamena schools of Honolulu, has been visiting the schools of Boston and other cities.

DR. ERNEST LINWOOD WALKER, formerly chief of the biological laboratory of the Federal Bureau of Science, and chief of the department of medical zoology at the University of the Philippines, Manila, has been appointed associate professor of tropical medicine at the George Williams Hooper Foundation for Medical Research, University of California.

EDGAR S. BRIGHTON, Ph.D., at present a member of the faculty of Nebraska Wesleyan University, will go to Wesleyan University at the conclusion of the present academic year as associate professor of ethics and religion.

WASHINGTON UNIVERSITY, St. Louis, announces the following promotions in the department of arts and sciences, effective July 1, 1915: Mr. Walter E. McCourt from associate professor of geology to professor of geology; Dr. Charles E. Cory from assistant professor of philosophy to associate professor of philosophy; Dr. LeRoy McMaster from associate professor of chemistry to professor of chemistry; Mr. D. C. Nicholson from instructor in drawing to assistant professor of drawing; Dr. William F. Gephart, professor of economics, to be head of the department of economics, political science and sociology; Dr. Charles E. Persons from assistant professor of sociology to associate professor of sociology; Mr. Garnett G. Sedgewick from instructor in English to assistant professor of English; Dr. George W. Moffitt from instructor in physics to assistant professor of physics. George Irving Dale has been appointed assistant professor of Spanish and Italian. He is now instructor in the department of Romance languages, Cornell University. Candidate for Ph.D. degree, Cornell, 1915.

THE trust estate of $3,250,000 left by Miss Elizabeth Thompson, will on the death of her brother and sister be equally divided among the following institutions: The Children's Aid Society, the New York Association for the Improvement of the Condition of the Poor, the New York Historical Society, the Society of the New York Hospital, the Presbyterian Hospital and Columbia University.

THE Michigan legislature has appropriated $350,000 for the erection of a new university library building for the University of Michigan.

A COMMITTEE from the proposed Panama Missionary Conference, made up of many Protestant Christian bodies, has visited Secretary Bryan and reports that he would like to see established in the city of Panama a Christian university. He hopes, so it is reported, that there are rich men and women in this country who will, when they see the matter as he sees it, give the money to found the institution.

A BILL is now pending in the Italian legislature, after favorable report by a committee, decreeing an age limit without any exceptions for all the professors in the universities throughout Italy.

DEANS of twelve New England colleges were present at the annual conference of the Association of Administrative Officers of New England Colleges, held at the University of Maine on May 20. Deans Howard McClenahan, of Princeton University, and A. E. Burton, of the Massachusetts Institute of Technology, were invited to be the guests of the association.

THE third annual conference of American Association of Agricultural College Editors will be held at the College of Agriculture, University of Wisconsin, June 24 and 25. Among those giving addresses will be Dean H. L. Russell, of Wisconsin; Mr. G. W. Wharton, chief of office of information, Washington; Mr. Charles Dillon, managing editor of Capper publications, Topeka, Kansas; Mr. Forrest Crissey, well-known writer of Geneva, Ill.; Professor Bristow Adams, of Cornell, and others. Editors of agricultural colleges and

experiment stations are cordially invited to attend. Those desiring programs should write to B. E. Powell, secretary, College of Agriculture, Urbana, Illinois.

The board of regents of the University of Minnesota has approved the plan of a required military encampment of cadets of the university for the week preceding commencement each year. The new rule will take effect in 1916. The encampment will be held at Fort Snelling near the Twin Cities at the junction of the Minnesota and Mississippi rivers.

One of the effects of the European war is the fact that the oldest journal, *Le Muséon*, published by the University of Louvain, is now published through the courtesy of the syndics of the Cambridge University Press, England, and the American agency for the publication has just been undertaken by the University of Chicago Press. Over two hundred pages of material for the third and fourth numbers of *Le Muséon* for 1914 are supposed to have been lost in the fire which destroyed the offices of the Belgian publisher in the early days of August; and one of the collaborators on the last number of the journal was taken a prisoner in the war and died in a hospital. All supporters of oriental studies will be glad to know that the first issue of this journal for 1915 will soon be published with contributions from many well-known continental and English scholars.

The first number of a new periodical in a special field is announced for publication this month by the University of Chicago Press under the title of the *Quarterly Journal of Public Speaking*. The editors of this new journal, which will serve as the official organ of the National Association of Academic Teachers of Public Speaking, announce a list of contributions to the first number which illustrate the scope of its editorial policy. The list includes "The Forum as an Educative Agency," by R. L. Lyman, of the University of Chicago; "Faculty Help in Intercollegiate Contests," by Frank H. Lane, of the University of Pittsburgh; "The Need for Research," by J. A. Winans, of Cornell University; "The National Association," by J. M. O'Neill, of the University of Wisconsin; and "State Organization for Contests in Public Speaking," by Edwin Dubois Shurter, of the University of Texas.

It has been voted unanimously by both of Yale's undergraduate faculties to establish a new alternative plan of admission, and to place, with certain restrictions, this new plan of examinations as well as the old plan under the administration of the college entrance examination board. The alternate plan of examinations involves: (1) the submission of a satisfactory school record, attested by principal or headmaster; (2) a comprehensive examination in not more than four subjects; (3) admission of the candidate without conditions, or his rejection. For admission to Yale College under the new plan, each candidate must be examined in the following four subjects: Latin, mathematics, French or German, and English. To be admitted to the Sheffield Scientific School under the new plan, the candidate must be examined in one subject from each of the following four examination groups: English, mathematics, Latin or French or German or Spanish, physics or chemistry or botany or biology or mechanical drawing or history.

At Harvard University there has been appointed a "Committee on Students' Use of English," which consists of J. D. M. Ford, modern languages, chairman; Charles B. Gulick, classics; C. N. Greenough, English; James H. Woods, philosophy; A. N. Holcomb, history; Kersopp Lake, divinity; R. DeC. Ward, climatology. The powers and purposes of the committee are defined in these four resolutions of the faculty:

> A permanent committee of the faculty on students' use of English shall be appointed, such committee to be made up of members of several departments, and to have general supervision of our students' written English.
>
> The executive officer of this committee shall be its secretary, who shall be a member of the committee and of the faculty. It shall be a part of his duty to inspect, from time to time, the written work of students and to report to the committee on its quality.

Instructors in all departments, especially men recently appointed, shall be invited to confer with the secretary concerning our students' usual faults and the best method of correcting them.

All instructors shall be expected to refer students who seem to them deficient in English to the secretary, who shall advise these students, and who may impose on them special tasks, such as outside reading and reports, or additional prescribed work in English composition, such work not counting for the degree.

DISCUSSION AND CORRESPONDENCE

THE TRUSTEES AND THE FACULTY AT THE COLLEGE OF WOOSTER

THE action early in the current year of the board of trustees of the College of Wooster, at Wooster, Ohio, in repudiating the judgment of the president and faculty raises an important question of college polity. After considering the carefully formulated and printed adverse report of the faculty and the opinion of the president, the trustees voted to introduce a two years' normal course for the training of elementary and grade teachers. When the trustees deliberately adopted a policy which he opposed and which the faculty had rejected, the president of the college resigned.

The detailed report of the faculty, the faculty minority report, a supplementary report of the faculty commenting on the minority report, and a recent statement of the executive committee of the board of trustees are all in print and it is possible to make a statement of the facts. A "summer school" has been maintained for several years, not by the college but by the principal of the academy; this private school occupies the buildings and campus of the college by the courtesy of the trustees. The question of a normal course for elementary teachers arose in an effort to save this large, private summer school. The head of this summer school attempted to meet the requirements of the new state school code by a series of summer sessions; the state department refused to approve the plan, and an effort was made to bring the College of Wooster to establish such a course. A letter dated December 2 from the state department to the head of this private summer school contains the statement: "I had in mind a two-year normal course to be run throughout the year. I now learn from your letter that what you had in mind is to have a series of summer courses, add them together and call it two years. . . . I do not see how this department could recognize your course as a two years' course. It will be necessary to have something definite to run as a regular school."

The president and a part of the faculty had been opposed to this private summer school (statement of the executive committee of the trustees) and the friends of Wooster differ as to its value. A large majority of the faculty and the president decided against the establishment of a normal course of two years for elementary and grade teachers. They feel that the college needs all its resources for college work, that it endangers the aims, ideals and standards of the school, that an adequate course of the sort at Wooster is impossible. The report of the faculty shows careful study of the situation in the state, of the attitude of standardizing agencies like the National Bureau of Education, the Carnegie Foundation, the Ohio College Association and the Presbyterian College Board; there is a careful consideration of the available resources of the school for its present work and for the proposed course. To any one familiar with the problems, the suggestions of the minority of the faculty, including the head of the summer school, seem superficial and inadequate.

The trustee board had no reason to question the competency of their president and faculty. President Holden had been an unusually successful college administrator and there is no doubt of the ability and zeal of the faculty. Nor could the trustees feel that they were compelled to settle a closely contested point where doctors disagree. The expert judgment was clear: the president and at least a two thirds majority of the faculty had given their verdict against the proposed course. But the board of trustees takes the extraordinary position that the responsibility for such a judgment rests with the trustees. "We knew that Dr. Holden opposed the introduction of the new department. . . . We were reluctant to promote measures they (the faculty) disap-

proved. But the responsibility was ours. We could not abdicate it." This board of trustees is not a self-perpetuating body but is appointed by the Presbyterian Synod; they are not and can not be fitted as a body of men to render such a decision; they have neither the training nor experience necessary. Because they employ professional men they have made the mistake of assuming that they may tamper with work demanding professional experience and skill. It is not a question of "abdicate" but of "arrogate."

It can not be too strongly asserted that matters of educational policy must be left to men competent to handle them, and that in the nature of things no trustee body of substantial men drawn from other occupations can presume to settle matters of internal policy and administration of a college. That must be the province of the president and faculty. If the controlling body feel that they can not trust the president and faculty to make decisions in educational matters, they should at once take steps to secure men whom they can trust. It would be well if such a provision were written into the charter and by-laws of every college governing body. The executive committee of the trustees of Wooster express naïve surprise that President Holden tendered his resignation; there was no other course; they had branded him and his faculty less competent to judge the needs and policies of the college to which he has given sixteen years of thought and service than a miscellaneous body of men appointed by the synod to be trustees of a foundation. There was nothing but resignation left for a self-respecting educator.

R. H. Stetson

Oberlin, Ohio,
May 15, 1915

SHOULD HISTORY TEACHERS USE THE ECONOMIC INTERPRETATION OF HISTORY?

How many teachers, do you think, teaching history in our high schools to-day, have any but the vaguest conception of the "economic interpretation of history"? Many teach without any particular interpretation, and if they teach the facts with open mind and the aid of a good modern text-book, they may present the subject from a fairly unbiased viewpoint. To present the facts as they occurred was Ranke's ideal in writing history and it produced a clear, unprejudiced narrative, but purely political and traditional in character. However, sources upon which the facts and conclusions of history are founded must often be interpreted, and secondary sources, especially, can be little trusted to give us the unbiased truth of the past. We are compelled with such sources as Herodotus, Plutarch and Tacitus to consider the personal equation, the environment and temperament of the author.

As with our sources, so with our writers of history to-day and of the last two centuries, few have written without some decided bias, strong thesis, or philosophical interpretation. Some historians wrote from the now antiquated theistic viewpoint, others from the idealistic interpretation of Hegel. Another made history purely political, sometimes in the sense that "history is past politics," and, again, a combination of the idealistic and political, as the dominating force of a political ideal such as democracy in the development of government. Many of our historians with Carlyle have made history a series of acts performed by a few great men. The physiographic interpretation claiming for location, soil, and climate a place as a factor in the progress of civilization has influenced all of our modern texts. But, here, as in Michelet and Freeman, geography and history have been so combined as to leave the political still the dominating force. Each interpretation has enriched the content of our text-books by selecting new material that would otherwise have been neglected. However, each one alone has proved to be too narrow to interpret all of the facts of the past and to draw from them their deepest meaning. Many of our history teachers and texts are already deeply influenced by these various interpretations which historiography has produced in the past century. And, now, the economic interpretation of history is demanding a place in the consideration of historians and history teachers.

This theory was first clearly enunciated in 1848 in the communist manifesto. Until re-

cently, it has been a distinctly socialist interpretation, although we find hints of it in the works of some non-socialist writers. Is it because of this fact that history teachers have been ignorant of this theory, or afraid to investigate it? Professor Seligman in his book "The Economic Interpretation of History" has raised the veil, or perhaps, more correctly, the ban from this illuminating method of studying the past. It brings us closer to the heart and life of the people of the past, in closer contact with man's mastery over nature through human labor rather than the purely physical determinism of geographical and climatic conditions. The way men toiled which makes up the greatest part of life and the effect of this labor upon the growth of civilization is no longer merely incidental to some political or religious change. It reveals to us the very basis of society, the origin of class domination and its influence upon political and social development.

It is not necessary to abandon all the contributions of other theories, but the new interpretation demands first place as throwing the deepest searchlight into the obscurity of the past ages and explaining those facts in such scientific light that we are able to draw from them a working theory for the future. Whether we accept the economic interpretation as the sole interpretation revealing the economic forces as the only determining factor of history, or, merely, as one of the angles from which the past may be viewed with the economic conditions undoubtedly the dominant force, we have no right as twentieth century teachers to ignore it in our class work. Ancient history with all its remoteness from modern life touches us more closely in its economic aspects than in the life of its kings or the arrangements of its governments. The depth of insight, the earnestness and seriousness, and above all, the hopefulness with which it deals with the problems of the past and future make it a power in the class room. Professor Seligman has shown that an acceptance of the economic interpretation does not necessarily mean the acceptance of socialism. However that may be, we can not but reach this conclusion that, if economic forces have been dominant in the past, all hope of reform of any lasting good must be based upon a sane and just economic foundation.

ALICE MCFARLAND

QUOTATIONS

THE GARY PLAN

LAST night's meeting of the Public Education Association, at which the principal of one Bronx school described the operation in it of the Gary plan, and that of a Manhattan school the Ettinger variation of it, while the reorganization of other schools was discussed, is evidence that the western innovation has invaded New York. A year after Mayor Mitchell's visit to Indiana, it is yet known only in a tentative way. Besides the places named, only one Brooklyn school has given it a trial. But the board of education has appropriated $50,000 for further work in Brooklyn, and is contemplating the expenditure of $150,000 more in the Bronx; while several reports on a large-scale application of the Gary plan have been made—the majority favorable—and the visits of Superintendent Wirt and Dean Schneider have stimulated interest. To what extent is it possible to adapt to New York the plan so successful in the small factory city? How great will be the alteration in our present system, and what will be the benefits gained? These are questions already practical.

The Gary system comprises several unique educational features. It proposes so to use the school buildings, and to lengthen the school day, as to double the number of children accommodated; to offer a large variety of extension activities, both for young people and for adults; to extend the instruction in manual training and other industrial branches so as to put "pre-vocational" work on a much more satisfactory basis; to allot more time for supervised play; and to introduce a system of departmental teaching which will permit teachers to specialize along the lines of their greatest aptitude. On general principles, there is no reason why a city should not undertake one or all of these things. It would be a stupid mistake to duplicate Superintendent

Wirt's organization exactly, but the spirit can be striven after anywhere. The plan may well be tried in only one school or section at a time. The giving of half the longer school day to physical training, practical work, science and the auditorium, with the use of a single room or laboratory by two or more individual groups, and the departmentalizing of teaching, would solve many problems in crowded districts. If it is argued that a huge city's school system must be uniform, the reply is that a dead uniformity can not answer to our diverse needs.—New York *Evening Post*.

BOOKS AND LITERATURE

Educational Guidance. By T. L. Kelley, Ph.D., Teachers College, Columbia University, New York. Pp. 116. $2.

How accurately can the school performance of a pupil be foretold? The present study has attempted to answer this question by determining the ability and the achievement of a group of fifty-nine pupils whose scholastic records were uninterrupted from the fourth grade to the first year of the high school. The pupils were rated on the basis of (1) their grammar school records, (2) teachers' estimates, and (3) scores in special tests. The ratings from these three sources were then correlated with the performance in the first year of the high school. The study was confined to the records and tests in three subjects—mathematics, English and history.

The teachers' estimates covered intellectual ability, conscientiousness, interest in work, and oral expression. The special tests, besides covering the three studies concerned, included questions on the preference of magazines, books, amusements and the use of leisure time.

The data have been worked out very carefully according to a "regression equation" in which the prognosis of attainment in the first year of the high school may be ascertained with a high degree of accuracy on the basis of the three means of rating. The correlation is .79. "The elementary school records of the pupils give the most accurate estimate of the average class standing, as well as of standing in specific courses." The results of this study and its application in the classification of pupils upon entering high school, according to their probable showing, has large possibilities in it.

Daniel Starch

University of Wisconsin

Variation in the Achievements of Pupils. By C. H. Elliott, Ph.D., Teachers College, Columbia University, New York. Pp. 114. $1.25.

This study has for its main object the measurement of variation in the achievement of pupils in school work and for its specific problem the relation between achievement and size of classes. To this end, measurements, [illegible] by standard tests or by specially devised tests, were made in arithmetic, English composition, spelling, writing and range of vocabulary. The tests were carried out with 1,700 pupils in the fifth and seventh grades. A part of the investigation was supplemented from the records of some 10,000 pupils in 444 classes.

Spelling was tested by means of twenty words in dictated sentences. Writing was tested for speed and quality, the latter being measured by the Thorndike scale. English composition was tested by having the pupils write on a specified subject. The work was rated by the Hillegas scale. Range of vocabulary was determined by means of Thorndike's visual vocabulary tests. Arithmetical achievement was measured by the Courtis test number 7 of Series A. The administration and scoring of the tests seem to have been done with much care and accuracy.

The most valuable results consist of the tabulations showing the average achievement of the grades in each of the traits measured, the amounts of growth, the overlapping and the variability of the grades, and some facts concerning salaries, cost of instruction, and hours of work in school and at home. The standards of attainment will be useful for comparisons with other schools wherever the tests may be performed. The most striking result pertains to the effect of class size upon attainment. The author summarizes his extensive tabulation as follows: "So far as the records of these tests are valid, there is apparently no relationship between the size of the class in which the chil-

dren have been taught during the present year and the attainment or variability."

Administrators and students of education generally will find this investigation very interesting and useful.

DANIEL STARCH

UNIVERSITY OF WISCONSIN

SOCIETIES AND MEETINGS

THE INTERNATIONAL CONGRESS OF EDUCATION

THE joint resolution of congress inviting foreign nations to participate in the International Congress of the National Education Association was passed the last week in February, and official notices went out to the several nations in the early part of March. War conditions together with the lateness of this action have delayed us in making definite announcements concerning prospective foreign speakers. Matters are adjusting themselves favorably and the program will contain representatives from the following countries: Argentine Republic, Canada, England, China, France, Germany, Guatemala, Honduras, Italy, Japan, Philippine Islands, Russia.

The general sessions of the International Congress will be held August 16, 19, 25 and 28. The speakers and topics definitely scheduled are as follows:

President's Address, "The Teacher and War," by David Starr Jordan.

"Women and War," by Jane Addams.

"Educational Progress of Fifteen Years," by Elmer Ellsworth Brown.

"Organization of Public Education," by Payson Smith and Ellwood P. Cubberley.

"The Montessori System," by Madame Montessori.

"Financing Public Education," by James Y. Joyner.

"Secondary Education in South America," by Ernsto Nelson.

"Adaptation of Rural Education to Needs of Rural Life," by P. P. Claxton.

"Preparation and Efficiency of Rural Teachers in the United States," by Harold W. Foght.

"Education and Race Improvement," by S. J. Holmes.

"Rural Education and Genetics," by H. J. Webber.

"Self-government in Secondary Schools," by Richard Welling.

"Cost and Labor of English Teaching," by E. M. Hopkins.

"The Junior College," by Alexis F. Lange.

"School Hygiene—Recent Developments and Future Possibilities," by Lewis M. Terman.

"Vocational Training," by Ella Flagg Young.

"Mothercraft," by Martha Foote Crow.

"Vocational Aspect of Home Economics," by Ednah A. Rich.

"Teachers' Organizations," by William B. Owen.

"Elimination of Adult Illiteracy," by Cora W. Stewart.

"Sex Morality and Sex Hygiene, as the Aim of Sex Education," by Thomas M. Balliet.

"Education of the Negro," by Hollis B. Frissell.

"Education of the Filipinos," by John B. De Graff.

"Education of the Japanese," by Sidney L. Gulick.

"Agricultural Education," by Percy G. Holden, H. J. Waters and D. B. Johnson.

"Professional Education," by James Parker Hall.

"Education of the Physician," by Ray L. Wilbur.

"Education of the Engineer," by Charles D. Mars.

"Higher Ideals in Education," by Charles F. Thwing and William T. Foster.

International Peace:

"Woman's Work for Peace," by May Wright Sewall.

"The Teacher's Work for Peace," by Fannie Fern Andrews.

"Internationalism," by John Mez.

In the Congress on School Hygiene, which is to be held August 17, William E. Watt, of Chicago, will discuss "The Schoolroom Window." F. B. Dresslar, Peabody College, Nashville, Tenn., will discuss "The Problems to be considered in Selecting School Grounds," and Lewis M. Terman, Stanford University, Cal., will discuss "The Mental Hygiene of Talented Children."

A Congress on Educational Investigations will be conducted by the National Council of Education, the general topic being "American Education the Business of the State." Carroll G. Pearse, Milwaukee, Wis., will discuss

"The American View as Distinguished from That Held by Other Nations." Ellwood P. Cubberley, Stanford University, Cal., and Elmer E. Brown, New York University, will discuss "The History and Development of American Education." J. H. Van Sickle, Springfield, Mass., Charles H. Keyes, Saratoga Springs, and Frank Strong, University of Kansas, will discuss "The Present Activity and Accomplishments." "Its Future Outlook and Possibilities" will be discussed by Grace C. Strachan, Brooklyn, J. Stanley Brown, Joliet, and Guy Potter Benton, University of Vermont.

The Congress on Music Education will be held August 18. In addition to the regular program, there will be given an evening concert of brief sketches of music of the Hindoos, Chinese, Japanese, Hawaiians and Filipinos, with illustrations by natives in native costumes and using native instruments and language.

The general subject of the Congress on Physical Education, which will be held August 18, is "Playgrounds." Persons appearing on the program are: George E. Dickie, Oakland, Cal.; Edward B. de Groot, San Francisco, Cal.; Harriet W. Thompson, Eugene, Ore.; Katherine M. Cook, Washington, D. C.; Charles E. Teach, Orange, Cal.; Charlotte Stewart, Salt Lake City, Utah; A. E. Winship, Boston, Mass.; Everett C. Beach, Los Angeles, Cal.; J. W. Seaver, New Haven, Conn.; Richard G. Boone, Berkeley, Cal.; F. H. Clark, Central City, Colo.

In the Congress on Elementary Education to be held August 20, some of the speakers are: Madame Montessori, Rome; A. E. Winship, Boston; Josephine Corliss Preston, Olympia, Wash.; A. E. Lange, University of California; Frank L. Crone, Director of Education for the Philippines.

The Congress on School Administration to be held on August 20 presents the following program:

President's Address, by O. M. Plummer.

"School Survey," by E. P. Cubberley.

"School Board Members," by W. E. Chancellor.

"Problems of a Director," by R. E. Blight.

"School Buildings and Grounds," by John J. Donovan and William B. Ittner.

"The School and the Teacher," by T. W. Churchill.

"Tenure of Office," by E. C. Elliott and Grace De Graff.

"Some Problems," by P. P. Claxton.

The Congress on Science Education, August 20, will be addressed by: M. Thomas Fullan, Alabama Polytechnic Institute, Auburn, Ala., and George R. Twiss, Columbus, Ohio, on "Physics and Manual Training." Earl R. Wooster, State Normal School, Lewiston, Idaho, will speak on "Correlation of Chemistry and Agriculture." S. H. Dadisman, Iowa College of Agriculture, Ames, Iowa, and John G. Coulter, Bloomington, Ill., will speak on "Biology for the Rural School." H. W. Foght, Washington, D. C., will speak on "Danish Agricultural Education and Its Bearing Upon Rural Education in America." Otis W. Caldwell, University of Chicago, will speak on "The Place of Pure Science in Our Public-school System." Henry S. Pritchett, Carnegie Foundation, will speak on "Tests of Instruction in Applied Science." United States Commissioner Claxton will speak on "Cultural Value of Science Instruction."

The Congress on Secondary Education will be held on August 23 with the following program:

"The Place and Function of the High School in the American System of Education," by J. Stanley Brown.

"The Possibilities of the High-school Library," by R. T. Hargreaves.

"Faculty Advisers in the High School—Their Need and Function," by Herbert O. Williams.

"The Extra Activities of the High School: The Relation of the Faculty to the Social Interests of the School; The Relation of Athletics to the School; Organized Literary, Debating and Social Clubs," by V. K. Froula.

"Practical Arts for Girls in the High School," by Mary Putnam.

"Sex Pedagogy in the High School," by Henry E. Brown.

"High-school Efficiency and What it Means to a Community," by W. H. Snyder.

"The Organization of High Schools Into Junior and Senior Sections," by P. P. Claxton.

"The High School of the Future," by Lewis R. Avery.